

Space Weather Highlights
17 – 23 April 2006

SEC PRF 1599
25 April 2006

Solar activity was at very low to low levels. A single C 2.6 flare was observed at 22/1639 UTC near the east limb in the vicinity of new Region 875 (S11, L=116, class/area, Cao/270 on 23 April). Region 875 appears to be the return of old Region 865 which produced two M-class flares on its last transit.

No greater than 10 MeV proton events were observed this period.

The greater than 2 MeV electron flux at geosynchronous orbit was at very high levels on 17 – 18 April and high levels on 19 - 21 April.

The geomagnetic field ranged from quiet to active levels at middle latitudes. High latitudes experienced mostly quiet to minor storm levels with a single period of severe storm conditions observed midday on 22 April. Solar wind speed ranged from a low of near 325 km/s late on 19 April to a high of about 625 km/s early on 23 April. The period began with wind velocity elevated at about 550 km/s as a coronal hole wind stream rotated out of a geoeffective position. Unsettled to active conditions were observed early in the period due to the high speed wind flow; however the IMF Bz remained quiet, not varying much beyond ± 3 nT. The IMF Bz remained weak through midday on 21 April and wind flow steadily decayed to about 325 km/s during this period. As a result, the geomagnetic field remained quiet to unsettled with one isolated minor storm period observed at high latitudes midday on 20 April. By midday on 21 April, a period of enhanced solar wind conditions were observed when Alfvén waves caused the IMF Bz to fluctuate between +10 to -15 nT through about midday on 22 April. The geomagnetic field responded with unsettled to active conditions at middle latitudes and active to severe storm levels at high latitudes. By the end of the summary period, the IMF Bz returned to more normal levels, not varying much beyond ± 3 nT, while the geomagnetic field became quiet at all latitudes.

Space Weather Outlook
26 April - 22 May 2006

Solar activity is expected to be at predominately very low to low levels with isolated moderate activity possible from Region 875 through 06 May.

No greater than 10 MeV proton events are expected.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels
Tuesday, April 25, 2006

The geomagnetic field is expected to be at quiet to unsettled levels for the majority of the forecast period. Active to minor storm conditions are expected on 02 May and again on 19 May. Active to major storm conditions are expected on 06 – 07 May and on 10 – 12 May. Activity is due to effects from recurrent coronal hole wind streams.



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 ⁻⁶ hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
17 April	78	48	50	A3.6	0	0	0	0	0	0	0	0
18 April	74	46	30	A2.2	0	0	0	0	0	0	0	0
19 April	76	38	40	A2.7	0	0	0	0	0	0	0	0
20 April	79	30	70	A3.5	0	0	0	0	0	0	0	0
21 April	79	14	30	A5.3	0	0	0	0	0	0	0	0
22 April	82	15	10	A9.5	1	0	0	0	0	0	0	0
23 April	87	24	270	B1.1	0	0	0	0	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ² -day-sr)			Electron Fluence (electrons/cm ² -day-sr)		
	>1 MeV	>10 MeV	>100 MeV	>.6 MeV	>2MeV	>4 MeV
17 April	9.4E+5	1.5E+4	3.5E+3		2.7E+9	
18 April	4.0E+5	1.6E+4	3.8E+3		3.6E+8	
19 April	6.0E+5	1.6E+4	3.7E+3		1.1E+9	
20 April	1.5E+6	1.6E+4	3.8E+3		9.3E+8	
21 April	1.2E+6	1.7E+4	3.9E+3		2.5E+8	
22 April	2.7E+5	1.6E+4	3.7E+3		9.9E+6	
23 April	3.4E+5	1.7E+4	3.8E+3		2.0E+7	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
17 April	4	2-1-0-0-0-0-1-3	5	2-2-1-2-1-1-1-2	6	2-1-1-0-1-2-1-3
18 April	5	3-3-1-0-0-1-0-1	5	3-3-1-1-0-0-1-0	6	3-3-1-1-1-1-1-2
19 April	2	2-0-1-1-1-0-0-1	3	1-1-1-3-0-0-0-0	4	2-0-1-2-0-2-1-1
20 April	3	0-1-0-1-3-1-0-1	9	0-1-1-1-5-3-0-0	5	0-1-1-1-2-2-0-1
21 April	6	1-2-2-1-2-3-1-1	8	1-1-1-2-2-4-2-1	8	1-2-2-1-2-4-2-2
22 April	10	3-3-3-3-2-2-1-1	38	5-4-4-7-5-2-1-1	18	4-4-3-4-3-2-1-1
23 April	8	1-3-4-1-1-1-0-2	6	2-2-3-2-1-1-0-1	8	1-3-3-1-1-2-1-2

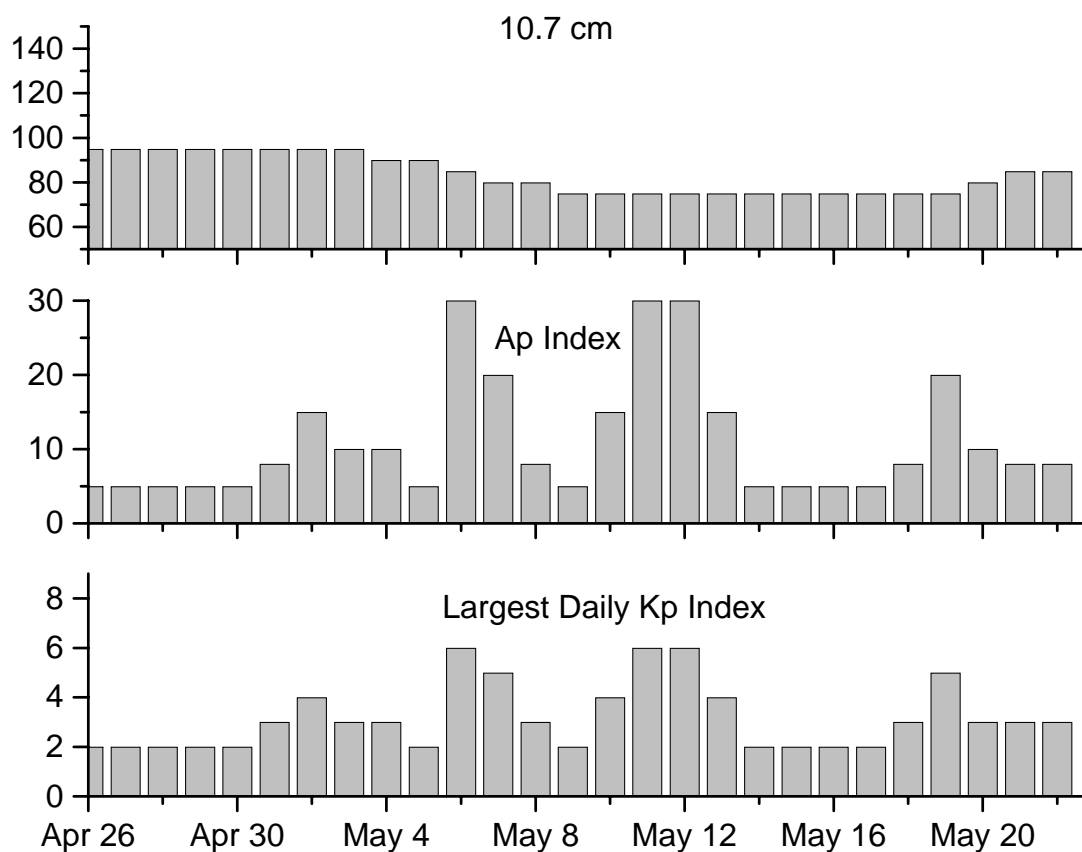


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
17 Apr 0518	ALERT: Electron 2MeV Integral Flux >1000pfu	17 Apr 0500
18 Apr 0531	ALERT: Electron 2MeV Integral Flux >1000pfu	18 Apr 0500
19 Apr 0520	ALERT: Electron 2MeV Integral Flux >1000pfu	19 Apr 0500
20 Apr 0522	ALERT: Electron 2MeV Integral Flux >1000pfu	20 Apr 0500
21 Apr 0827	ALERT: Electron 2MeV Integral Flux >1000pfu	21 Apr 0805
21 Apr 1636	WARNING: Geomagnetic K=4	21 Apr 1636 – 22 Apr 1500
21 Apr 1637	ALERT: Geomagnetic K=4	21 Apr 1637
23 Apr 0709	ALERT: Geomagnetic K=4	23 Apr 0708



Twenty-seven Day Outlook



Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index
26 April	95	5	2	10 May	75	15	4
27	95	5	2	11	75	30	6
28	95	5	2	12	75	30	6
29	95	5	2	13	75	15	4
30	95	5	2	14	75	5	2
01 May	95	8	3	15	75	5	2
02	95	15	4	16	75	5	2
03	95	10	3	17	75	5	2
04	90	10	3	18	75	8	3
05	90	5	2	19	75	20	5
06	85	30	6	20	80	10	3
07	80	20	5	21	85	8	3
08	80	8	3	22	85	8	3
09	75	5	2				



Energetic Events

Date	Time		X-ray		Optical Information			Peak		Sweep Freq	
	$\frac{1}{2}$		Integ		Imp/	Location		Radio Flux		Intensity	
	Begin	Max	Max	Class	Flux	Brtns	Lat CMD	#	245	2695	II IV

No Events Observed

Flare List

Date	Time			Optical	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
17 April	0724	0730	0737	B1.3			
	1806	1848	1928	B2.0			
18 April	No Flares Observed						
19 April	1152	1157	1203	B1.3			
20 April	1727	1731	1738	B1.6			871
	1857	1904	1910	B2.2			871
21 April	0041	0049	0058	B4.5			871
	2040	2047	2100	B1.8			
	2351	2355	2359	B1.0			
22 April	0240	0252	0319	B3.5			
	0511	0522	0540	B5.6			
	0831	0841	0847	B6.0			
	1238	1248	1253	B1.3			
	1451	1457	1503	B1.9			
	1630	1639	1649	C2.6			
	1917	1926	1933	B2.4			
	2038	2044	2047	B1.2			
	2234	2238	2241	B1.8			
	2242	2248	2253	B3.1			
23 April	0339	0344	0347	B4.8			
	0429	0438	0447	B2.2			
	0649	0656	0715	B7.3			
	1328	1333	1359	B2.9			
	1421	1427	1434	B5.5			
	1518	1523	1526	B5.9			
	2009	2025	2034	B3.2			875



Region Summary

Location			Sunspot Characteristics												
			Flares												
Helio			Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	(° Lat ° CMD)	Lon	(10 ⁻⁶ hemi)	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4

Region 870

10 Apr S08E22	336	0010	01	Axx	001	A									
11 Apr S08E09	336	0020	02	Hsx	003	A		2			1				
12 Apr S08W05	337	0020	02	Cso	005	B									
13 Apr S08W19	338	0010	01	Axx	002	A									
14 Apr S09W30	336	0000	01	Axx	001	A									
15 Apr S09W43	336														
16 Apr S09W56	336														
17 Apr S06W74	340	0010	01	Axx	001	A									
18 Apr S06W87	340														
								2	0	0	1	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 337

Region 871

10 Apr S08E52	306	0050	12	Cao	002	B									
11 Apr S08E39	306	0040	02	Hax	002	A		1				1			
12 Apr S08E23	309	0050	05	Cso	003	B									
13 Apr S07E08	311	0030	05	Cao	006	B									
14 Apr S07W04	310	0030	05	Cso	003	B									
15 Apr S06W18	311	0060	05	Cao	006	B									
16 Apr S06W33	312	0060	05	Cso	005	B									
17 Apr S06W46	312	0030	03	Cso	003	B									
18 Apr S06W59	312	0010	01	Hsx	001	A									
19 Apr S06W66	306	0010	01	Axx	001	A									
20 Apr S06W79	306	0010	01	Axx	001	A									
								1	0	0	0	1	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 310



Region Summary-Continued

Region Summary Continued															
Location			Sunspot Characteristics												
			Flares												
Helio			Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	(° Lat ° CMD)	Lon	(10 ⁻⁶ hemi)	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4

Region 872

11 Apr S09E74	271	0050	01	Hsx	001	A
12 Apr S07E59	273	0030	01	Hsx	001	A
13 Apr S07E46	273	0030	01	Hsx	001	A
14 Apr S07E33	273	0020	03	Cso	003	B
15 Apr S08E21	272	0060	09	Bxo	008	B
16 Apr S06E08	271	0020	08	Bxo	006	B
17 Apr S08W05	271	0010	03	Bxo	003	B
18 Apr S08W18	271	0000	01	Axx	001	A
19 Apr S08W31	271	0010	03	Bxo	003	B
20 Apr S08W44	271					
21 Apr S08W57	271					
22 Apr S08W70	271					
23 Apr S08W83	271					

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Still on Disk.

Absolute heliographic longitude: 271

Region 873

11 Apr S04E48	297	0050	05	Dso	010	B
12 Apr S04E35	297	0090	08	Dai	016	B
13 Apr S04E22	297	0050	08	Dsc	009	B
14 Apr S03E08	298	0020	07	Cao	004	B
15 Apr S03W05	298	0020	01	Hsx	001	A
16 Apr N01W17	296	0010	03	Bxo	004	B
17 Apr S04W37	303	0000	01	Axx	001	A
18 Apr S04W50	303	0010	01	Hsx	001	A
19 Apr S04W63	303					
20 Apr S04W76	303					
21 Apr S04W89	303					

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 298



Region Summary-Continued

Region Summary Continued															
Location			Sunspot Characteristics												
			Flares												
Helio			Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	(° Lat ° CMD)	Lon	(10 ⁻⁶ hemi)	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4

Region 874

18 Apr N00E15	238	0010	02	Hsx	003	A
19 Apr N00E02	238	0020	06	Cao	004	B
20 Apr S01W11	238	0060	05	Dao	009	B
21 Apr S01W25	238	0030	04	Dro	004	B
22 Apr S02W39	239	0010	04	Bxo	005	B
23 Apr S01W55	242	0000	01	Axx	001	A

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 238

Region 875

23 Apr S11E71	116	0270	11	Cao	003	B
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Still on Disk.

Absolute heliographic longitude: 116

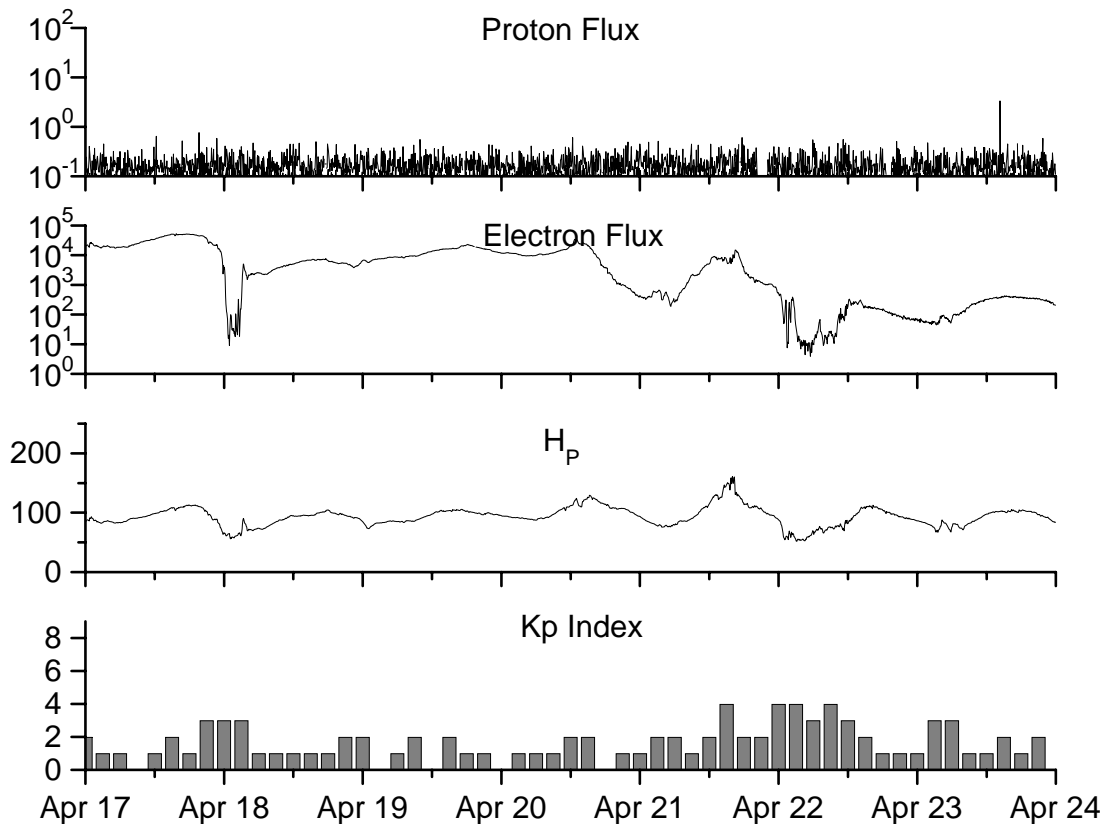


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		*Penticton	Smooth	Planetary	Smooth
	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
2004									
April	59.3	39.3	0.66	77.9	45.6	101.2	112.3	11	15.5
May	77.3	41.5	0.54	74.1	43.9	99.8	109.2	8	14.3
June	78.9	43.2	0.55	70.4	41.7	97.4	107.2	8	14.0
July	87.8	51.0	0.58	68.3	40.2	118.5	105.9	23	13.8
August	69.5	40.9	0.59	66.6	39.3	110.1	105.0	11	13.8
September	50.0	27.7	0.55	63.7	37.6	103.1	103.7	10	13.6
October	77.9	48.4	0.62	61.3	35.9	105.7	102.1	9	13.5
November	70.5	43.7	0.62	60.0	35.4	113.2	101.5	26	14.1
December	34.7	17.9	0.52	58.8	35.3	94.6	101.3	11	14.8
2005									
January	52.0	31.3	0.60	57.3	34.7	102.4	100.3	22	14.7
February	45.4	29.1	0.64	56.4	34.0	97.3	98.5	11	14.6
March	41.0	24.8	0.60	55.8	33.6	90.0	97.2	12	15.3
April	41.5	24.4	0.59	52.6	31.7	85.9	95.5	12	15.7
May	65.4	42.6	0.65	48.3	29.0	99.5	93.2	20	14.8
June	59.8	39.6	0.66	47.9	28.9	93.7	91.9	13	13.9
July	71.0	39.9	0.56	42.9	25.9	96.6	87.8	16	11.8
August	65.6	36.4	0.55	45.4	27.5	90.7	89.3	16	12.2
September	39.2	22.1	0.56			90.8		21	
October	13.0	8.5	0.65			76.7		7	
November	32.2	18.0	0.56			86.3		8	
December	62.6	41.2	0.66			90.8		7	
2006									
January	28.0	15.4	0.55			83.8		6	
February	5.3	4.7	0.89			76.6		6	
March	21.3	10.8	0.51			75.5		8	

NOTE: All smoothed values after September 2002 and monthly values after March 2003 are preliminary estimates. The lowest smoothed sunspot index number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 23, RI= 120.8, occurred April 2000. *After June 1991, the 10.7 cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.





Weekly Geosynchronous Satellite Environment Summary
Week Beginning 17 April 2006

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-11 (W103) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

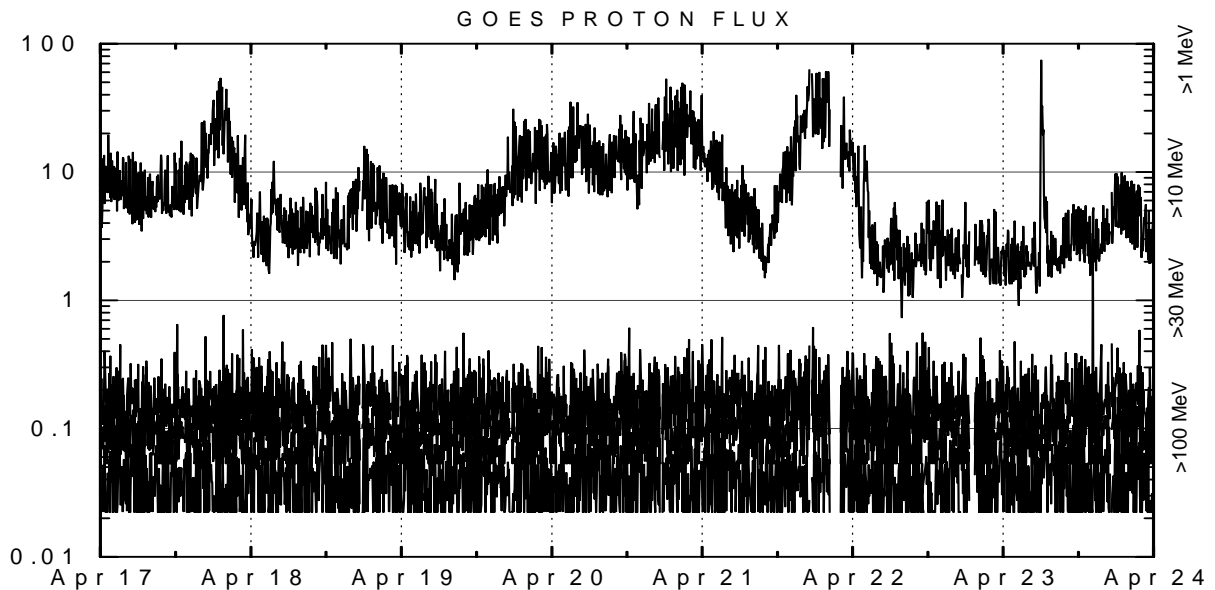
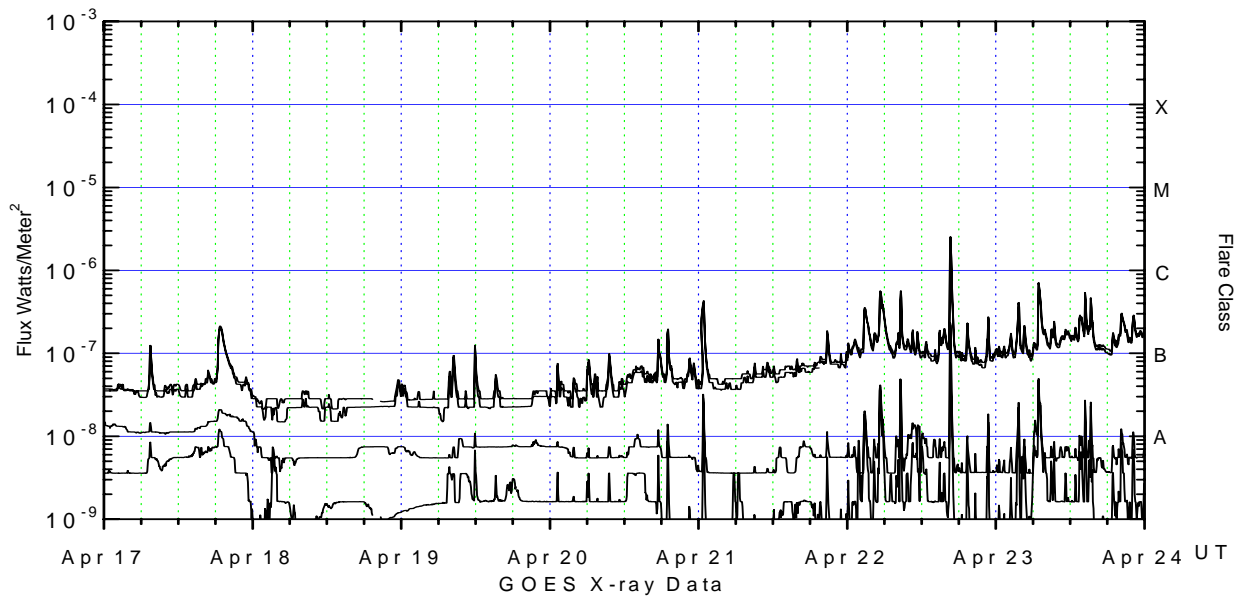
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec-sr) with energies greater than 2 MeV at GOES-12 (W75).

H_p plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

K_p plot contains the estimated planetary 3-hour K-index (derived by the Air Force Weather Agency) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and Hartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC), British Geological Survey (BGS) and the US Geological Survey. These may differ from the final K_p values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SEC and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and K_p are "global" parameters that are applicable to a first order approximation over large areas. H parallel is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





Weekly GOES Satellite X-ray and Proton Plots

X-ray plot contains five-minute averaged x-ray flux (watts/m^2) as measured by GOES 12 (W75) and GOES 10 (W135) in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five-minute averaged integral proton flux ($\text{protons/cm}^2\text{-sec-sr}$) as measured by GOES-11 (W103) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu ($\text{protons/cm}^2\text{-sec-sr}$) at greater than 10 MeV.





Space
Environment
Center

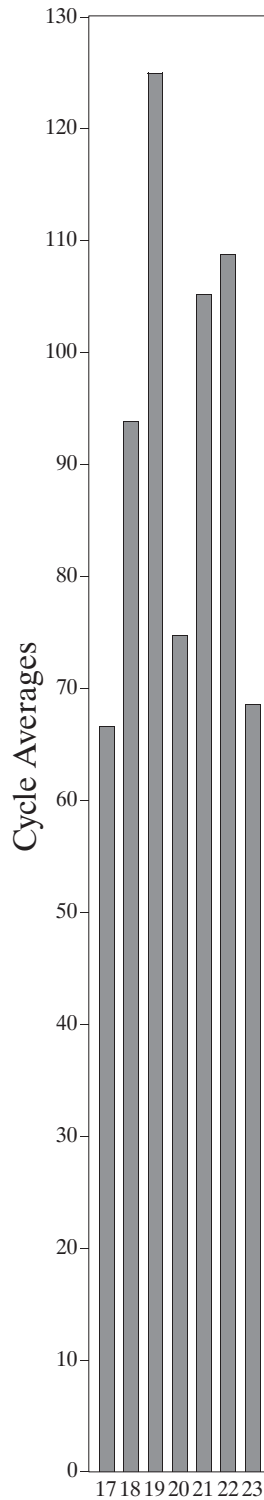
Sunspot Number (RI)

March 2006
(Month 114)

Preliminary data



Comparison of Cycles
at current month in cycle



K. Tegnell

Cycle

Monthly Averages

